DOCUMENT RESUME

ED 025 853 EA 001 940

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Pub Date Nov 67

Note-14p.; Paper presented at the U.S. Office of Educ. Symposium on Operations Analysis of Educ. (Washington, D.C. November 19-22, 1967).

EDRS Price MF-$0.25 HC-$0.80

Descriptors-Educational Needs, *Educational Planning, Literature Reviews, *Program Budgeting, *School Administration, *Systems Approach

Identifiers-Planning Programming Budgeting Systems, PPBS

Concepts which are salient features of the systems approach do not appear to have permeated school administration beyond the threshold of awareness. Confusion among administrators as to the meaning and potential of the systems approach can be partly attributed to its overzealous adherents, semantic difficulties among experts, and its application to minor, pedestrian problems. Experts must agree on standard meanings for such terms as systems analysis, program budgeting, programming planning budgeting systems (PPBS), and cost effectiveness, which are alternatively used synonomously and to mean different things. Major policy issues that create the greatest administrative problems must be shown to be susceptible to the systems approach. The potential of this approach for educational administration will have to be publicized through special seminars, conferences, and workshops. Finally, to create readiness for the stimulate use of the systems approach, improvements in education that will be needed include (1) a clearer definition of educational objectives, (2) use of models for at least parts of school operations, (3) development of quantitative reasoning and analysis capabilities, (4) greater emphasis on generating alternative solutions to problems, (5) increases in school district staffs for planning and systems analysis, and (6) better dissemination of systems concepts and techniques. (TT)

THE SYSTEMS APPROACH TO SCHOOL ADMINISTRATION: SOME PERCEPTIONS ON THE STATE OF THE ART IN 1967

by

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for

THE U.S. OFFICE OF EDUCATION SYMPOSIUM ON OPERATIONS ANALYSIS OF EDUCATION
(November 19-22, 1967)

Educational administration reflects the ferment of the times. Many new and different types continue to emerge, so much so that school administrators have become a subset within the universe of all educational administrators.

It is significant that since 1945 there has been growth, in number and types of persons who, for want of a better term, can be identified as "non-school" educational administrators. They occupy positions in federal agencies (USOE and OEO are illustrations) or in federally related or completely supported projects such as regional educational laboratories and research and development centers. "Non-school" educational administrators are found in industry directing in-house training programs or spearheading development of hardware and software with future sales potential in public education.

This paper shall be limited to the systems approach in local school administration, particularly the superintendency.

Systems analysis, systems approach, and operations research are repeating the history of other new concepts that struggled to acquire a standard meaning. Often these terms are defined by the whim of the user. In some cases the search for a standard meaning is pooh-poohed while others believe the subject is too complex to produce general agreement on terminology. It

EA 001 940

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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is not unusual to find systems terminology used indiscriminately as well as inaccurately or as new labels for archaic and unrelated practices. Semantic confusion is a deterrent to the development of any field of inquiry.

Systems analysis is more popular than systems approach but my preference is for the latter. Analysis is only one dimension of a total approach, others being systems design, systems operation, and systems evaluation. Systems analysis in this paper has a restricted meaning and bears a close relationship to operations analysis, that is, the types of inquiry answerable to quantitative analysis.

Dimensions of the Systems Approach

What cluster of operational behaviors or administrative activities in general can be characterized as being consistent with the systems approach? The salient features, in my estimation, are 1) clear delineation of long- and short-range objectives capable of being translated into operationally meaningful activities and subsequent evaluation; 2) recognition of the dynamic nature of goals and sensing when new ones have emerged or when a reordering of priorities among existing objectives is imperative; 3) recognition of change as normal in viable organizations operating within an environment in ferment and creation of vehicles to facilitate prudent change; 4) generation of alternative means to utilizing resources to attain objectives; 5) creation of models to study part or all of the system; 6) utilization of quantitatively oriented tools, vehicles, and procedures in analysis of systems; 7) dedication of a high priority in the time schedule of top-echelon administrators to planning and programming activities; 8) employment of interdisciplinary teams of specialists in problem analysis, new systems design, operations evaluation, and the like; 9) consideration of coordination of

the evergrowing number of educational specialists within the system as a matter of high echelon concern; and 10) in general, implementation of sophisticated, objective and scientifically oriented procedures in decision making.

The measure of whether systems has permeated school administration in 1967 is the degree to which any or all of the above characteristics of systems are now in practice. Hard data are lacking. The best that can be submitted are one man's tentative conclusions and opinions based on his review of the literature, involvement in conferences and less formal meetings, and present study of systems as chairman of the AASA Commission on Administrative Technology. These experiences are not adequate substitutes for hard data and perhaps someday this shortcoming will be repaired.

If school administrators were asked whether they viewed the school as a network of interrelated subsystems, each charged with responsibility for accomplishing part of the overall task of converting educational inputs into outputs, most would say that they did so view the school even if the full meaning of the question was not clear. My point is that such systems concepts as "the whole is greater than the part," "an enterprise should be perceived as a cluster of interrelated activities," and "the school is a unified systematic vehicle" have a familiar and favorable ring to educators. The crucial test is whether implications of the concepts are evident and skills have been developed in the utilization of approaches consistent with systems theory, particularly those based on the use of models, generation of alternatives, and sophisticated quantitative analysis techniques.

Systems in School Administration Today

To generalize, it can be said that school administration in late 1967

is on the threshold of awareness of concepts, vehicles, and procedures related to systems. Only a limited comprehension of concepts and even less capability in the utilization of systems techniques or procedures presently characterizes the field. There are exceptions to all generalizations and some parts of the country are better versed in systems than others. School administrators as yet do not perceive systems as an approach to better define, comprehend, or resolve perplexing educational issues or operational problems. There is more talk about systems and references to it in professional literature are on the rise. To suggest a "growing awareness" is not to imply that systems has cornered a major share of publication space or that there exists more than superficial knowledge. Although more is being heard of specific procedures such as PERT AND PPBS, few relate these to systems and even fewer view them as means of coping with complex decisions.

Confusion among school administrators as to what systems analysis means and, even more, about what it can contribute to attacking persistent problems showed little signs of abating in 1967. Part of this can be attributed to overzealous adherents of systems. There are some who sound more like Madison Avenue pitchmen than scholars promising omnipotence if not infallibility to those who heed the gospel of quantitative analysis. There is always the danger of generalizing from simple cases--governed by a single objective, clear-cut control over resources, simple output measurement, and easily quantifiable data--in which analysts with the aid of mathematical tools were able to identify the best course of action. The more mature perceptions of Sisson[1/] suggest, "As we study more and more complex systems, we find that the selection of the optimum or best course of action becomes nearly impossible, even with

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1/ R. L. Sisson, Applying Operational Analysis to Urban Educational Systems, A working paper (mimeographed), Philadelphia: Management Science Center, University of Pennsylvania, January 6, 1967.

the aid of mathematical tools." He added: "Unfortunately, however, it is very unlikely that we can find a mathematical structure which will permit us to manipulate a symbolic model of a situation as complex as a school district. Mathematics, as advanced as it is, has not developed techniques which permit the manipulation of the thousands of highly interacting variables required to model a school district." This sober and objective evaluation of complexities confronted in school administration is in stark contrast to the claims of some from the world of industry who grant almost magical and omnipotent powers for the systems approach in solving all educational problems by tomorrow.

The other horn of the dilemma is that those aspects of school administration most amenable to operations analysis such as transportation, school plant planning and construction, inventory control or food services are less likely to be classified as major or crucial problems of administrators. Actually superintendents have been roundly criticized for pre-occupation with "administrivia" to the neglect of crucial long-range policy problems in instruction, race relations, adapting the institution to change, teacher militancy, or amelioration of social injustices.

If the level of entry into schools of sophisticated, quantitatively oriented tools associated with systems happens to be via such relatively pedestrian problems as determining optimum menus for school lunch programs, school administrators are not likely to be impressed with the systems approach. This would tend to re-focus the attention of administrators on those aspects of the system which are less vital to its survival. If systems is to make a difference it must not tarry too long on the more mundane concerns which skilled educational administrators have been able to "eyeball" within 75 to 85% of optimum without high powered mathematical procedures. It must move and quickly to the major policy issues-- those which are creating the greatest

turmoil or most likely to be responsible for the demise of the school superintendent. Although systems may not solve the really significant policy dilemmas that confront school administrators, in the sense of computing with infallible precision the optimum course of action, it can be employed to generate alternatives and frame issues in a manner that will sharpen the intuition and judgment of the educational decision maker. As Fisher[2/] put it, "In practically no case should it be assumed that the results of analysis will make the decision. The really interesting problems are just too difficult, and there are too many intangible (e.g. political, psychological, and sociological) considerations that cannot be taken into account in the analytical process, especially in a quantitative sense." Again, it is repeated that quantitative analysis should not be defined as synonomous with the systems approach. Operations analysis is a subset within the total approach.

Toward Resolution of Semantic Difficulties

Earlier it was suggested that there is a danger of being mired in a semantic swamp. Thus, systems analysis may be confused with utilization of computers in schools. Computer based-electronic data-processing has preempted the term to describe a position classification or a survey procedure to ascertain status of information needs and processing requirements. A A person described more accurately as an "information systems analyst" may carry instead the unqualified title of "systems analyst." In some cases the "systems analyst" in data-processing operations is nothing more than a highly skilled programmer or computer operator capable of identifying best procedures for inserting, manipulating, or retrieving information in a computer-based

2/ G. H. Fisher, "The Role of Cost-Utility Analysis in Program Budgeting," Program Budgeting, David Novick, Ed., Washington, D.C.: U.S. Government Printing Office, 1965, p. 59.

information system. Individuals outside EDP as well as within have been prone to equate systems analysis with survey activities. What some call a system analysis of the school was previously referred to as "school survey."

It is not unusual to find practitioners in education confusing cost-effectiveness with the traditional cost accounting or unit cost analysis rather than with systems. Some fear that cost-effectiveness is a re-incarnation of a repudiated approach of selecting one educational program over another on the basis of which costs less. Preoccupation with the cost dimension obscures the effectiveness dimension as well as analysis based on objectives, resources, and generating alternatives to resource utilization.

Program budgeting creates even more controversy and deserves a more extensive review. The abridgment of a Rand Corporation study edited by David Novick and entitled simply Program Budgeting[3/] embraced a comprehensive conceptualization of program budgeting. It was similar, for all practical purposes, to what was originally referred to as PPBS, namely Planning, Programming, Budgeting System. Hitch[4/] declared that the original developers of this systems procedure called it the PPB System and not program budgeting. Others argue that PPBS is not synonymous with program budgeting. In some cases, program budgeting, PPBS, cost-effectiveness, and systems analysis are conceived so broadly that the terms become synonymous.

Whether program budgeting is a more meaningful fiscal analysis and control device or a comprehensive systems approach vehicle is a matter of definition. Determining who should assume primary responsibility for the implementation of program budgeting to education will be difficult without

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3/ David Novick, ed., Program Budgeting, Washington, D.C.: U.S. Government Printing Office, 1965, 236 pp.

4/ C. J. Hitch, "Program Budgeting," Datamation, 13: 37-40, Sept. 1967

clarification of its meaning. A debate has already been triggered in one state as to whether the adaptation of PPBS to public education should involve the superintendent of schools or remain a matter of primary concern of school business officials. The U.S. Office of Education could contribute unwittingly to an impending, but unnecessary, jurisdictional dispute by supporting research grants for the adaptation of PPBS in public school districts that fail to specify meanings of key concepts.

According to Hatry[5/] the distinctive characteristics of PPBS are 1) identification of fundamental objectives; 2) explicit consideration of future year fiscal implications; and 3) systematic analysis of alternative ways of meeting objectives. McKean and Anshen[6/] identified four main dimensions of program budgeting as 1) restructuring budget exhibits in terms of categories closer to true outputs and accumulating costs in more meaningful categories; 2) developing a budget that implies a longer time horizon than the typical pattern, which is limited to one year; 3) use of cost-utility analysis as a logical way to measure relations between inputs and outputs, that is, to emphasize analytical contributions of program budgeting; and 4) developing arrangements for enforcing allocative decisions through appropriate implementation of provisions.

In PPBS, as in the more comprehensive view of program budgeting, the fundamental concern is for an objective, scientific, and defensible procedure for allocation of resources among competing educational objectives and programs. PPBS, or the comprehensive conception of program budgeting, is a

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5/ H. P. Hatry, Criteria for Evaluation and Planning State and Local Programs. Sub-Committee on Intergovernmental Relations, 90th Congress 1st Session, Committee Print, Washington, D.C.: U. S. Government Printing Office, 1967, p. 1.

6/ R. N. McKean and M. Anshen, "Problems, Limitations and Risks," Program Budgeting, David Novick, Ed., Washington, D.C.: U.S. Government Printing Office, 1965, p. 219.

decision-making approach that must involve top-echelon administrators, namely, the general superintendent. It is clear that the school fiscal officer is not, and has not been typically, the one person in school administration who identifies fundamental objectives of an educational institution, although he may be involved in the process. Furthermore, generating alternative vehicles for reaching educational objectives may involve but is never limited to the school fiscal officer. Nor can it be said that there presently reside in the school business office individuals with unusual decision-framing capabilities based on use of quantitatively oriented approaches. Systems capability, if it exists at all, is seldom confined in the school fiscal office.

The notion that a single specialist in the hierarchy be the only one concerned with and assume dominant direction for an approach as fundamental as PPBS is inconsistent with systems theory. Interrelationships of key executives, that is, the team or task-force approach, are basic to systems. Clearly then, PPBS, or the expanded conception of program budgeting, implies that the school business officer is one member of an interdisciplinary team searching for ways of implementing PPBS in education.

It is my opinion that the term PPB System has many shortcomings. It projects an incomplete version of what is involved. Activities are not confined to planning, programming, and budgeting but include analysis and evaluating as well. In any case, more than budgeting (the familiar word in PPBS) is involved. Confining it to planning, programming and budgeting leaves out the most important or crux of the procedure, namely, systematic analysis of the budget items. PPBS is related to decision which reflects on allocation of resources to various educational programs. It deserves top-level administrative concern in education.

If the more limited concept of program budgeting, such as developing

programmatic classifications for educational budget categories, is employed, then there is justification for greater involvement of the school business officer, but not to the exclusion of other administrative personnel.

It is my opinion that there is merit in considering program budgeting as a subset of PPB System. In this more limited context, program budgeting focuses on output-, mission- or program-oriented categorization of budgets. It involves restructuring of budget presentations to reveal outputs as well as inputs and to better relate each to objectives. There are some school districts which proudly advertise implementation of program budgeting. An analysis reveals that while the term was adopted the actual practice was far removed from program budgeting or PPB System. Inputs were reclassified in these school districts into instructional "program" categories for music, art, mathematics, etc. and with little or no relationship to program outcomes or objectives.

Systems has acquired a holy ring. It is surrounded with connotations that suggest something good, something powerful, something to be desired. The new terminology has been pre-empted by some to project the image of erudition and innovativeness even though analysis of actual practices suggests other things. It is imperative that standard meanings be developed soon lest the movement suffer from the experts within the field being unable to communicate with each other because basic concepts mean different things to different people. Not everyone talking about systems uses the same data base. Naive enthusiasm must be replaced by disciplined utilization.

AASA and Dissemination of Systems Concepts and Techniques

A special American Association of School Administrators (AASA) Commission on Administrative Technology was created early in 1966 and charged

with the responsibility of identifying promising new approaches in management of other fields that can be adapted to school administration. The Commission includes a mix of practitioners, that is, superintendents, as well as professors concerned with the preparation of future practitioners. It is approaching the end of its deliberations and will report to the membership by the spring of 1968. It is concerned and impressed with the possibilities of applying the systems approach to school administration. It is possible to have bad systems analysis, for not everyone has equal systems capability, and it is possible to have sophisticated analysis of inaccurate information based on an unreliable sample. A data base in the field of inquiry is imperative to minimize the building of a house of cards based on poor data.

Something more than a publication will be needed to reach school administrators and to carry them beyond naive enthusiasm for a new approach. Special seminars, workshops, and conferences will be developed to sensitize administrators to the promise of systems approach as well as to help each to develop skills in its utilization or sensing those best qualified to serve as a systems analyst in the schools.

Recognizing that a void exists, the challenge is to design temporary systems to enhance development of systems capability among future and present school administrators. The systems approach is more likely to flourish where certain conditions prevail. We are at the point of recognizing that a condition of readiness precedes learning and utilization of the unknown or strange set of practices. Some of the more pressing improvements in education needed to create readiness and, therefore, subsequently to stimulate the use of systems are:

1) <u>The preparation of a more definitive set of educational objectives</u>: Statement of educational goals that exist are much too broadly conceived.

Educational missions or goals that can be defined in performance terms will be necessary to further systems capability in school administration. This is a tremendous and time consuming task. It will take at least two years and more likely five years of diligent effort to bring about this transformation.

2) Recognition of the need for the generation and use of models of at least parts of school operations. Attitudes favorable toward the use of, and skills in the generation of, models of various aspects of educational operations must be stimulated. Models are crucial to systems and little progress can be made without them. Very few models of education as a whole or any of its subsystems exist and few administrators think in such terms. Those with a data base in education in general and educational administration in particular are in the best position to generate useful models. To do this professionals in the field must acquire a better comprehension of the model development process.

3) Development of quantitative reasoning and analysis capabilities. Powerful mathematical tools and models can be used only by those with special skills and ability. Mathematics and economic analysis concepts, heretofore, have not been considered important in the preparation of special types of administrators or administrative assistants. The issue arises as to where school administrators go to recruit talent with analysis competencies. The short term response may be to search for such personnel in other fields such as economics or mathematics. The long term answer is to redesign preparation programs to answer the challenge for new specializations in administration.

4) Greater emphasis on generating alternative means to utilizing resources to attain objectives. Generating many ways to approach a solution to a problem and analysis of consequences of each can enhance decision-making capabilities of administrators.

5) A significant increase in administrative staff strength in local school districts for planning and systems analysis. Present numbers in the superintendency are hardly adequate to cope with existing operational problems. This is not a call for more of the same but for addition of administrative specialists who can generate alternatives, who can frame problems to facilitate prudent decision-making, and who have the concepts and skills in utilization of systems techniques and procedures. Such specialized personnel shall represent extensions or new creations of administrative planning and analysis staffs in school districts.

6) Better vehicles for the dissemination of systems concepts and techniques. It is highly desirable that systems concepts, tools, and procedures be disseminated in education as rapidly as possible. It is my opinion that systems capability will help school administrators cope with complexity and will facilitate prudent change within the system. A massive inservice effort must reinforce some significant changes in the professional preparation programs for school administrators.

There must be literally a systems effort to move beyond the confusion and limited awareness of systems approach in school administration that presently characterize the state of the art. It must be a task-force effort of local school administrators acting in concert with specialized representatives of institutions of higher learning, federal agencies and professional societies.

The American Association of School Administrators is seriously contemplating launching a new and exciting vehicle for the continuing professional development of practicing school administrators. It is presently designated as the National Academy for School Executives. Within its program may be a series of seminars, workshops, and clinics concerned with developing

systems capability among school administrators. The Academy, which may be launched as early as the summer of 1968, represents one vehicle presently on the drawing boards. It is being designed to do something about the confusion and contradictions that exist with reference to the implementation of the systems approach in educational administration.